



# School of Engineering, Mathematics & Science

FALL 2011



## > From the Dean

Over the past few years, you might have noticed we have used the word "interdisciplinary" more than once. Its usage has been one of our strategic goals, set to help build unity and utilize diverse experience within our School of Engineering, Mathematics and Science (SEMS).

Currently, we have a strong and robust enrollment within all three departments, are hiring new faculty, expanding the outreach program, developing new research projects, participating in conferences, publishing in journals, writing grants to government organizations and foundations and so much more. Please take a moment to see what we have been doing.

My Best Wishes,

**MARIA V. KALEVITCH, PH.D., DEAN & UNIVERSITY PROFESSOR**

## > New Center

This year we have created the SEMS Research and Outreach Center (SEMS-ROC), which will address grant writing opportunities, elevate research agenda for faculty and students, and promote student engagement, internships, co-ops and outreach activities. The center will work with all three departments and take a targeted approach to audit and evaluate faculty expertise.

## > New Curriculum

All SEMS departments have helped to contribute to our new minor in Alternative Energy and Sustainability. The minor is worth 15 credits and offers two tracks. It is built to suit the needs of both the university and SEMS students.

SEMS is also developing an energy track on the graduate level, intended to help address rising demands of Marcellus Shale and other energy companies in the area.



## > Research

One of our newest projects in SEMS, which deals with green energy, "Algae as a source of bio-fuels," was developed by a group of our own science and engineering faculty. This is a multiple year project with an interdisciplinary approach, which will involve many faculty, staff and students.



> LIKE US ON FACEBOOK... SEARCH RMU SEMS.

## > Awards

SEMS students continue to receive support through scholarships and awards. This year RMU awarded 16 presidential scholarships. Among those awarded, nine students were from SEMS. SEMS and our actuarial science colleagues helped secure the largest endowed scholarship in RMU's history. The \$1 million dollar endowed scholarship will support up to four students annually and will help increase diversity in the program and school.



**Dr. Tony Kerzmann**, and his Engineering Design Team, won 1st place in the PA Regional Energy Efficient Building

Competition. The teams' design for the competition involved building a pipe turbine, which was used to harness wasted water from facets and shower heads, and then used to create electricity. The RMU team, including **Dr. Kerzmann, Eugene Werner, Allan Page and Tom Teresi**, was awarded \$5000 for their win.

## > Faculty & Signature Program Spotlight

**Dr. David Hudak**, Associate professor of Actuarial Science and Director of the Actuarial Science program, has been teaching at RMU since 2003. He graduated with his Bachelor's Degree from Saint Vincent College in Mathematics, and his Ph.D from Carnegie Mellon University in Applied Mathematics and Numerical Analysis.



Initially Dr. Hudak did not jump right into teaching. He worked for various companies, including a Navy Think Tank, a Government Consulting firm and Actuarial firms. While working as an actuary he decided to pursue his interest in teaching and passion for actuarial science, as a professor.

He chose to make his career at RMU because of its actuarial science program and focus on students. Dr. Hudak says he genuinely enjoys working with students and advising them. He believes mentoring them is important to their educational successes and teaching allows him the chance to affect students' lives. He states "You don't make a difference in everyone's life, but you do have a chance to make a difference in someone's life."

RMU's actuarial science program started with 2-3 students 11 years ago, and has grown to around 100 students today. The program helps students go through the right steps to get a job, including making sure students pass the right tests and get an internship. RMU's program is also accredited through CAE, a big accomplishment, considering only about 20 schools in North America are accredited.

## > Student Spotlight



**Ryan Nearhoof**, from Mars, PA, is a senior at RMU. He will be graduating, in May 2011, with a BS in Environmental Science and a concentration in Pre-Medicine. Next year, Ryan will continue his education at the University of Pittsburgh School of Dental Medicine. He hopes to specialize in implants, and eventually open his own practice.

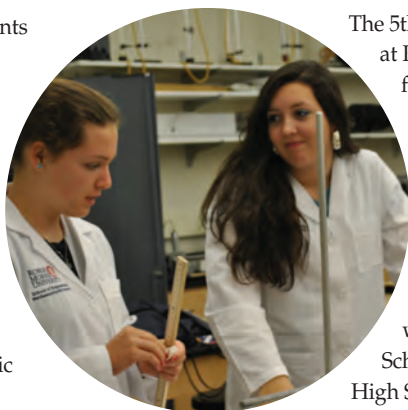
During his four years at RMU, Ryan participated in many extracurricular activities, including, Students for Environmental Science, the student athlete advisory committee, and playing as a line-backer for the RMU football team. Along with his successful outside activities, Ryan shined in the classroom as well, keeping a 3.7 GPA, and citing his professors knowledge, creativity and likability with keeping him motivated in his classes.

Ryan is excited for his transition to Dental School and offers these words of advice to younger students, "hard work is definitely important, but don't be discouraged if you get a few bad grades. The professors really help prepare you for things you may encounter on tests, but still be prepared to spend time studying."

## > FAST FACT: JOHN JAY CENTER GYM WAS THE VENUE FOR THE FIRST EVER ESPN

## > Outreach Events

**Dr. Paul Badger's** students helped host Chemistry demonstrations at Carnegie Science Center during National Chemistry Week. The volunteers showed middle school students chemistry concepts, including density, the periodic table and atomic structures.



The 5th Annual Science Bowl was held at RMU on Jan. 29. Eight teams and five schools participated in the competition. The teams competed against each other in a "jeopardy-like" atmosphere, answering science questions. After eliminations, three teams went to the final round, where Montour High School, team one, won 1st place, Pine Richland High School won 2nd place, and Shaler High School, team two, won 3rd place.

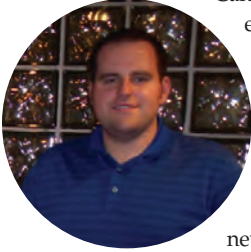
The Allegheny County Math Counts Competition was held on Feb. 19 at RMU. Middle School teams and individuals competed with timed tests. The 1st place team was Jefferson Middle School, and the 1st place individual was a 7th grade student from Jefferson Middle School. Winners qualified to compete in the state competition, held in Harrisburg in March.



## > Student Work

## > Alumni Spotlight

**Donald Swisher** and **Chris Bird** graduated from RMU's Manufacturing Engineering program in 2010. They were both hired almost immediately after graduation by AUMA Actuators, in Canonsburg, PA, as full-time manufacturing engineers.



Since being hired, Chris has worked on several projects in the machining department, to reduce scrap rates, as well as to improve the production of several products. He is currently working on transferring the production of six new products from AUMA's German factory to the plant in Canonsburg, PA. He is responsible for all of the programming of the CNC Equipment, including two high production horizontal mills, two centers, and one small vertical mill. He quotes his experience at the RMU Engineering Learning Factory, as making his transition to working in a factory a smooth one.



Similarly, Don has worked on several projects since being hired. His work focuses on the assembly area of the AUMA facility. He has worked on projects involving plant layout design, assembly center design (including tool and fixture design), manufacturing costing (material handling cranes, powder coating, tooling, etc), quality defect tracking and inventory management. Shortly after being hired, Don spent a week at AUMA's parent company in Germany working their engineers on various projects. Don believes that the RMU classes he took involving lean manufacturing, engineering costing, tool/fixture design, engineering drawing (2D & 3D) and computer programming (specifically Microsoft Access) have helped him the most as a manufacturing engineer.

>>**Jeff Cox** developed and manufactured nano-based coating at Northeastern University Center for High Rate Nanomanufacturing. >>**Jovanna Kirkling**, **Mollie Schmatz**, **Paul Evans**, **Paul Kelly** and **Samantha Chambers** worked with Dr. Paul Badger analyzing water quality in Narrows Creek Run. >>**Kelly Conley** completed her Research Experience in Undergraduate Program at Bradley University, and will be presenting her research at the Ecological Society of America Conference in Pittsburgh. >>**Steven Abel** and **Brandon Hess** collaborated with **Dr. Bill Dress** on a research project, which will examine soil quality and carbon sequestration in turf grass ecosystems. >>**Cleveland Savage** spent a second year working with NASA Johnson Research center as a summer scholar. >>**Samantha Pogel** and **Justin Wissinger** co-authored "Design and Manufacturing of Medical Devices with Antimicrobial Technology" with **Dr. Arif Sirinterlikci**, and it was published in the Yearbook of Society of Manufacturing Engineers. >>**Sarah Robb** completed her Research Experience for Undergraduates at Worcester Polytechnic Institute, in Tissue Engineering. >>**Rebecca Tokarsky** and **Laura Zalewsky** developed a summer camp for middle school students, under the supervision of **Dr. Matthew Maurer**, entitled "SMART- Science meets Art." As a result of the successful summer camp, they were invited to submit an article in Science Scope.

## > Scholarships

>>**Brendan Mathers** was awarded a \$7,000 Society of Manufacturing Engineers Education Foundation and a \$1,000 Past Chairperson's Educational Assistance Scholarship, by the American Society for Materials. >>**Chris Chavez** was awarded a 2-year \$10,000 National Action Council for Minorities in Engineering Scholarship. >>**Maritza Jimenez** was awarded a 2-year, \$10,000, National Action Council for Minorities in Engineering (NACME) Scholarship for biomedical engineering. >>**Trevor Green** was awarded the first full-time Highmark Scholarship for actuarial science. >>**Matthew Feryus** was awarded a \$2,000 John Culver Woodydy Scholarship. >>**Matt Dieterich** was awarded a 4-year \$4,000 Bayer Scholarship in Environmental Science.

## LIVE FEED NCAA PING PONG TOURNAMENT.

The Society of Women Engineers held an elementary school Expo at RMU on April 2. The Expo helped introduce children to the basic concepts of science and math through hands-on, interactive experiments. Experiments included, a popsicle stick catapult, toothpick bridge, hot air balloon, egg drop and tetrahedral kite.



The 4th Annual RMU-ACM (Association for Computing Machinery) High School Programming Competition, led by **Dr. Sushil Acharya**, was held on April 15, at RMU. Seven high schools made up 15 teams, which competed in a hybrid computer programming competition. Sewickley Academy won 1st place.

Summer Day Camps were held again this year at RMU. From June to August camps were held for middle school and high school students, and helped introduce the students to science, mathematics and engineering concepts. The camps included Animatronics, CSI Forensics, Effects of Pollution in Ecology, and Where the Wild Things Are.



## > Engineering Industry News

Manufacturing is still Pennsylvania's #1 industry, according to Petra Mitchell, who works for Catalyst Connection, claiming 13.6% of PA's gross state product. The individuals working in the manufacturing industry receive the highest average wages of any sector. A big area of opportunity is the Marcellus Shale boom. The opportunity comes from the tooling, fabricating and steel and chemicals involved in water processing.

Our engineering graduates have an excellent placement rate, and our new degree tracks in mechanical and biomedical degrees are rapidly growing. Our graduates currently work at companies including Boeing, Curtiss Wright, US Steele, Siemens, Bombardier, Westinghouse, Bayer and more.

## > Mathematics Industry News

The actuarial science field is growing and for many mathematicians, this is a good thing. Many actuaries are employed within healthcare, financial consulting and insurance industries; however there is a growing demand for actuaries in the healthcare market.

According to the Bureau of Labor Statistics, growing interest from the healthcare field is related to increased regulation of managed healthcare companies, as well as health care reform. As many companies gear up for major changes, they will utilize actuaries to meet their desire to contain healthcare costs and to evaluate the risks associated with new medical issues. Pittsburgh is home to several big health care companies, including Highmark, Cigna, UMPC, and Humana.

## > Science Industry News

The Marcellus Shale boom continues to grow in Pennsylvania and EQT Corporation, a leading energy provider based in Pittsburgh, has taken significant steps to reduce any harmful effects on the environment. EQT ranks among industry leaders in exceeding many federal, state and local regulations concerning water resource management, air emissions, mitigation practices and more. They guard freshwater supplies by triple casing each well, as well as conducting water sampling before and after drilling.

EQT is one of the largest natural gas exploration and production companies in the industry, owning 3.5 million acres of land and more than 14,000 wells. Of their 1800 employees, 1000 of them are based in Pennsylvania. The growth of the Marcellus shale industry offers many of our graduates opportunities for employment.



## > New Faces

**Dr. Jeffery Mitchell** – Appointed to Associate Dean; **Dr. Tamiko Youngblood** – Engineering Faculty; **Dr. Ben Campbell** – Engineering Faculty; **Dr. Melissa Hillwig** – Science Faculty; **Dr. Gary Gau** – Mathematics Faculty; **Kimberly Stewart** – Secretary II, Engineering; **Sarah Kerin** – Outreach Manager

## > Faculty News



**>>Dr. Gavin Buxton**, Assistant Professor of Physics, recently had a paper published in Soft Matter. The paper is titled "Self-Assembly of Mixtures of Nanorods in Binary, Phase-setting Blends."



**>>Dr. Catherine Hanna**, Assistant Professor of Science, continued her research on how the Lynx spider is affected by pesticides. She presented some of the data, with her co-researcher Chad Hanna, at The Behavior 2011 joint meeting, of the Animal Behavior Society and the International Ethological Conference.



**>>Dr. Priyadarshan Manohar**, Associate Professor of Engineering, organized the 'ASM Material Advantage' function at RMU in March. Speakers for the event included, Reeju Pokharel, a graduate student from Carnegie Mellon University, who presented her latest research and Paul Allen of TIMET Corporation, who spoke on materials challenges in the design of modern gas turbine engines.



**>>Dr. Yildirim Omurtag**, Engineering Department Head, was selected to give the keynote speech, titled 'Engineering Education in the Early 21st Century: Challenges and Changes' in Phuket, Thailand at Raja Mangala University of Technology (RMUT).



**>>Dr. Arif Sirinterlikci**, Professor of Engineering/ Co-head of SEMS-ROC, was invited to participate in the National Science Foundation ATE program review panel, to be held in December. He also recently published a paper in the 2011 Medical Manufacturing Yearbook for the Society of Manufacturing Engineers. The paper was titled 'Design and Manufacturing of Medical Devices with Antimicrobial Technology.'

**Have SEMS News? Send it to Sarah Kerin at [kerin@rmu.edu](mailto:kerin@rmu.edu). Newsletters will be published in Fall, Winter & Spring.**

> TO LEARN MORE ABOUT OUR DEPARTMENTS & PROGRAMS VISIT [RMU.EDU/SEMS](http://RMU.EDU/SEMS).